**CLAIMS** 

We claim:

1. A transmitter optical assembly comprising:

a transmitter substrate that includes a power line and a conductive path;

a laser source mounted on the transmitter substrate; and

a laser control mounted on the transmitter substrate, the laser control

communicably connected with one or more of the laser source, the power

line, and the conductive path, the laser control comprising a memory

portion, the memory portion including one or more memory components

for receiving or storing data.

2. The transmitter optical assembly as recited in claim 1, wherein the laser control

further comprises a laser modulator, the laser modulator administering an alternating

current from the laser control to the laser source; and a laser bias, the laser bias

administering a direct current from the laser control to the laser source.

3. The transmitter optical assembly as recited in claim 1, wherein the transmitter

substrate further comprises connections for one or more of a ground line, a diagnostic

data line, and a diagnostic clock.

4. The transmitter optical assembly as recited in claim 1, wherein the conductive path

is a transmission line that carries data from the host to the optical assembly, wherein the

data are ultimately transmitted at the laser source.

5. The transmitter optical assembly as recited in claim 1, wherein the transmitter

substrate comprises ceramic materials, and wherein circuit traces on the ceramic

materials include three-dimensional metallic sputtering to shield electromagnetic

interference.

6. The transmitter optical assembly as recited in claim 1, further comprising a monitor

photodiode, the monitor photodiode communicably connected with the laser source and

the laser control, the monitor photodiode providing the laser control with status

information about the laser source.

7. The transmitter optical assembly as recited in claim 1, wherein the memory portion

comprises one or more of an EEPROM, and a RAM.

8. The transmitter optical assembly as recited in claim 7, wherein at least one of the

one or more memory components includes a portion that stores one or more of status

and fault information, and operating temperature information.

9. The transmitter optical assembly as recited in claim 7, wherein at least one of the

one or more memory components includes a portion for receiving diagnostic data.

10. A receiver optical assembly comprising:

a receiver substrate that includes a power line and a conductive path;

a photodiode mounted on the receiver substrate;

an optical converter communicably connected with the photodiode, the optical

converter for converting a received optical signal into an electrical

signal; and

a processing control mounted on the receiver substrate, the processing control

communicably connected with one or more of the photodiode, the power

line, and the conductive path, the processing control comprising a

memory portion, the memory portion comprising one or more memory

components for receiving or storing data.

11. The receiver optical assembly as recited in claim 10, wherein the processing control

further comprises a temperature sensor.

12. The receiver optical assembly as recited in claim 10, wherein the optical converter is

an avalanche photo-diode, the receiver optical assembly further comprising a bias

control mounted on the receiver substrate, the bias control communicatively connected

with the optical converter, and the processing control.

13. The receiver optical assembly as recited in claim 10, wherein the conductive path is

a data receiving line that carries data from the receiver optical assembly to the host.

14. The receiver optical assembly as recited in claim 10, wherein the receiver substrate

comprises ceramic materials, and wherein circuit traces on the ceramic materials

include three-dimensional metallic sputtering to shield electromagnetic interference.

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15. The receiver optical assembly as recited in claim 10, wherein at least one of the one

or more memory components comprise one of an EEPROM, and a RAM.

16. The receiver optical assembly as recited in claim 15, wherein at least one of the one

or more memory components includes a portion for receiving and storing diagnostic

data.

17. The receiver optical assembly as recited in claim 16, wherein the receiver substrate

further comprises connections for one or more of a ground line, a diagnostic data line,

and a diagnostic clock.

- 18. A combination optical assembly comprising:
  - a combination transmitter/receiver substrate that includes a power line and a conductive path;
  - a photodiode mounted on the combination substrate, the photodiode configured to receive an optical signal from a fiber optic network;
  - a laser source mounted on the combination substrate, the laser source configured to provide an optical signal to a fiber optic network;
  - a processing control mounted on the combination substrate, the processing control communicably connected with the laser source, the control comprising a memory portion, the memory portion including one or more memory components for receiving or storing data.
- 19. The combination optical assembly as recited in claim 18, further comprising an optical converter communicably connected with the photodiode, the optical converter for converting a received optical signal into an electrical signal.
- 20. The combination optical assembly as recited in claim 18, wherein the processing control is further communicably connected with the transimpedance amplifier, the power line, and the conductive path.
- 21. The combination optical assembly as recited in claim 18, wherein the processing control further comprises a postamp.
- 22. The combination optical assembly as recited in claim 18, wherein the processing control further comprises a laser modulator, the laser modulator administering an alternating current from the laser control to the laser source.

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23. The combination optical assembly as recited in claim 18, wherein the processing

control further comprises a laser bias, the laser bias administering a direct current from

the laser control to the laser source.

24. The combination optical assembly as recited in claim 18, wherein the optical

converter is an avalanche photo-diode, the combination optical assembly further

comprising a bias control mounted on the combination substrate, the bias control

communicatively connected with the optical converter, and the processing control.

25. The combination optical assembly as recited in claim 18, wherein at least one of the

one or more memory components comprises one of an EEPROM, and a RAM.

26. The combination optical assembly as recited in claim 25, wherein at least one of the

one or more memory components is configured for receiving and storing diagnostic

data.

27. The combination optical assembly as recited in claim 26, wherein the combination

substrate further comprises connections for one or more of a ground line, a diagnostic

data line, and a diagnostic clock.

28. The combination optical assembly as recited in claim 27, wherein the diagnostic

data is communicated to the processing control from the host an I2C or MDIO circuitry.

29. The combination optical assembly as recited in claim 26, wherein the combination

substrate comprises ceramic materials, and wherein circuit traces on the ceramic

materials include three-dimensional metallic sputtering to shield electromagnetic

interference.

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30. An optical transceiver comprising a fiber optic subassembly operably attached to

the optical transceiver, the fiber optic subassembly comprising:

one of a transmitter, receiver, and combination transmitter/receiver substrate

including a power line and a conductive path;

means operably disposed within the fiber optic subassembly for communicating

high frequency optical data, wherein the means for communicating

optical data includes one or more conventional optical transceiver

components within the fiber optic subassembly, such that impedance that

would otherwise be present in a high frequency electronic data

communication is minimized.

31. The optical transceiver as recited in claim 30, wherein the means operably disposed

within the fiber optic subassembly for communicating high frequency optical data

comprises:

a photodiode mounted on the combination substrate, the photodiode configured

to receive an optical signal from a fiber optic network;

a laser source mounted on the combination substrate, the laser source configured

to provide an optical signal to a fiber optic network;

a processing control mounted on the combination substrate, the processing

control communicably connected with the laser source, the control

comprising a memory portion, the memory portion including one or

more memory components for receiving or storing data.

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